EPA Cokemaking Stakeholder Meeting

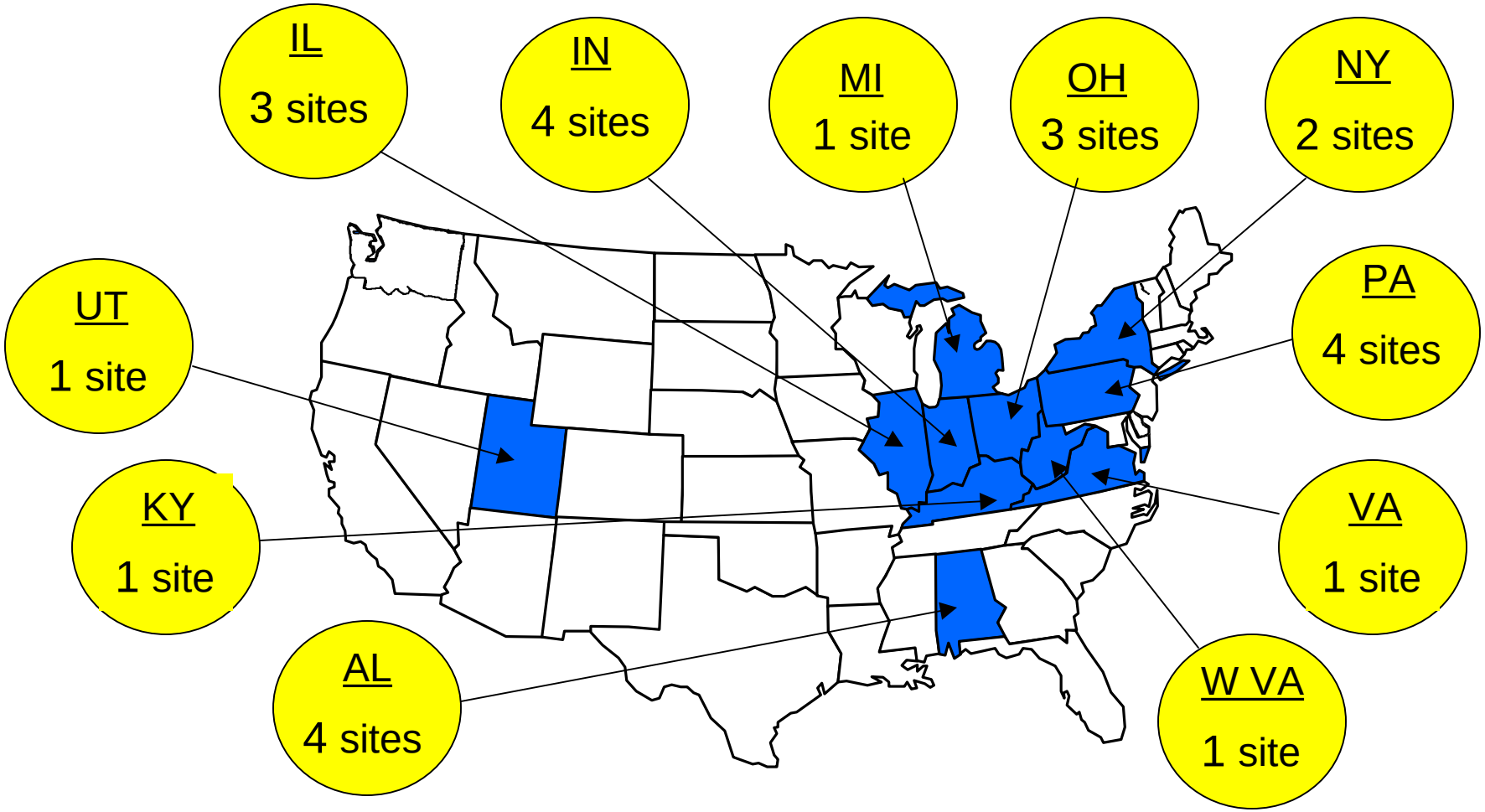
Development of Effluent Limitations Guidelines for
the Iron and Steel Point Source Category

July 27, 1999

Washington D.C.

Current Industry Status

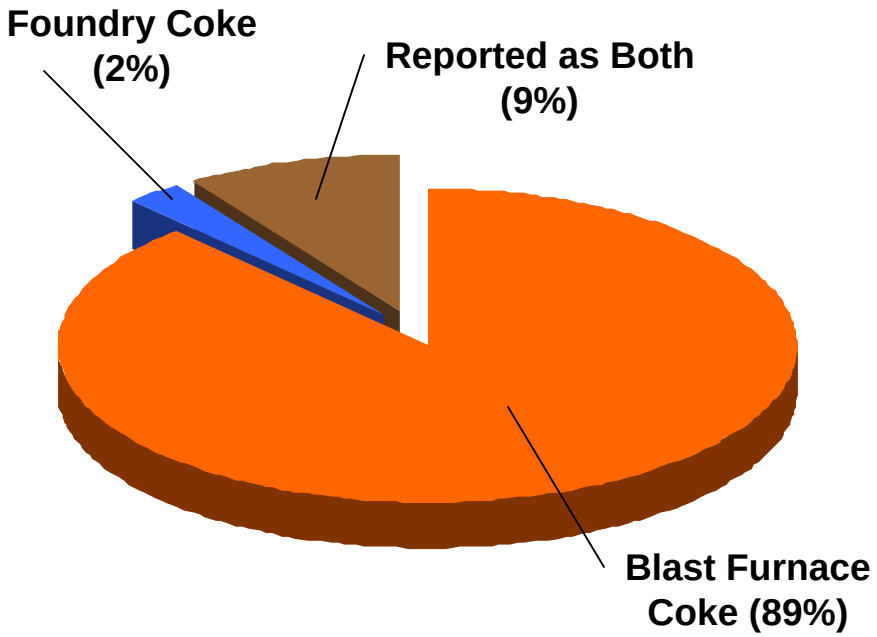
U.S. Coke Plants
(25 locations)



Coke Plant Profile

- Total of 25 sites in the U.S.
  - 23 by-product recovery sites; 2 nonrecovery sites
  - 9 sites located at integrated mills; 16 stand-alone sites
- Types of coke produced at sites
  - Blast furnace coke (19 sites)
  - Foundry coke (3 sites)
  - Blast furnace and foundry coke (3 sites)

Percentage of Total 1997 Coke Production by Type



Note: Data are based on 23 survey responses and do not include coke breeze

Clean Air Act Track

Company	Location	Coke Oven NESHAP Track	No. of Batteries
ABC Coke	Birmingham, AL	Extended	3
Acme Steel	Chicago, IL	Extended	2
AK Steel	Ashland, KY	MACT Extended	1 1
AK Steel	Middletown, OH	MACT	1
Bethlehem Steel	Chesterton, IN	Extended	2
Bethlehem Steel	Lackawanna, NY	Extended	2
Citizens Gas and Coke	Indianapolis, IN	Extended	3
Empire Coke	Tuscaloosa, AL	Extended	2
Erie Coke	Erie, PA	MACT	2
Geneva Steel	Vineyard, UT	Extended	4
Gulf States Steel	Gadsden, AL	MACT	2

Source: "American Coke and Coal Chemicals Institute Coke Oven NESHAP Track Selection Table (Updated March 1998)" distributed at the EPA Stakeholder meeting in Chicago, Illinois on January 27, 1999.

Clean Air Act Track (cont.)

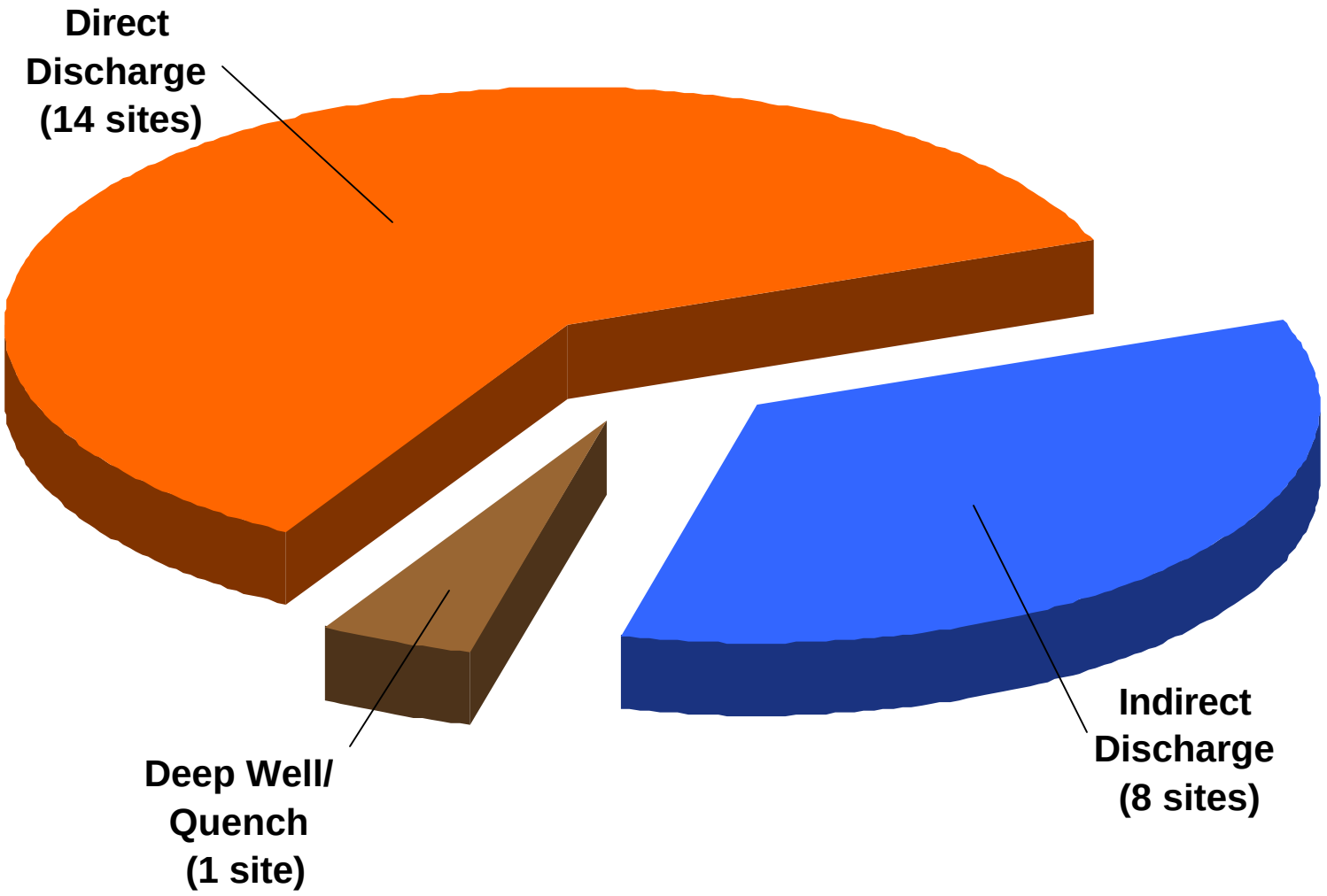
Company	Location	Coke Oven NESHAP Track	No. of Batteries
Indiana Harbor Coke	East Chicago, IN	----	----
Jewell Coal and Coke	Vansant, VA	Extended	4
Koppers	Monessen, PA	Extended	2
LTV Steel	Chicago, IL	Extended	1
LTV Steel	Warren, OH	Extended	1
National Steel	Granite City, IL	Extended	2
National Steel	Ecorse, MI	Extended	1
New Boston Coke	New Boston, OH	MACT	1
Shenango	Pittsburgh, PA	Extended	1
Sloss Industries	Birmingham, AL	Extended	3
Tonawanda Coke	Tonawanda, NY	MACT	1
US Steel	Clairton, PA	Extended	12
US Steel	Gary, IN	Extended	4
Wheeling-Pittsburgh	Follansbee, WV	Extended	4

Source: "American Coke and Coal Chemicals Institute Coke Oven NESHAP Track Selection Table (Updated March 1998)" distributed at the EPA Stakeholder meeting in Chicago, Illinois on January 27, 1999.

By-Products Recovered

- Ammonium sulfate
- Anhydrous ammonia
- Buckwheat coke
- Coke breeze
- Coke oven gas
- Crude tar
- Crude light oil
- Elemental sulfur
- Fuel tar
- Sodium phenolate
- Sulfuric acid
- Tar acid

Types of Wastewater Disposal for By-Product Recovery Plants (23 sites)



Wastewater Treatment by Direct Dischargers

- Alkaline chlorination
- Ammonia still
- Biological treatment
- Dephenolization
- Dissolved air flotation
- Equalization
- Filtration
- Granular activated carbon
- Indirect cooling
- Oil/Tar removal
- Primary clarification
- Secondary clarification
- Sludge dewatering

Wastewater Treatment by Indirect Dischargers

- Air stripping of biological treatment effluent
- Ammonia still
- Biological treatment
- Dephenolization
- Equalization
- Filtration
- Indirect cooling
- Oil/Tar removal
- Secondary clarification
- Sludge dewatering

Major factors under consideration for revised BAT/PSES

- Furnace vs. foundry coke production
- Age, size, and location of production facilities
- By-products recovered
- Process wastewater flows and wastewater pollutant loadings
- Coke quenching practices
- Co-treatment with other wastewaters
- Management of residuals

Sources of Coke Plant Wastewater Flows

- Air pollution control wastewater
- Ammonia recovery
- COG condensates
- COG desulfurization
- Equipment cleaning
- Final gas cooler
- Light oil recovery
- Steam condensate (ammonia still)
- Waste ammonia liquor
- Other miscellaneous sources

Water Sources for Coke Quenching

- Plant service water
- Noncontact cooling water
- Treated coke plant wastewater
- Untreated coke plant wastewater
- Treated wastewater from other sources
- Untreated storm water
- Wet air pollution control device
- Other sources

Biological Sludge Management by Percentage of Tons Generated

- Recycled to coke oven (65%)
- Landfilled (20%)
- Land applied (15%)

Note: Data are based on survey responses from 22 sites

Operating Cost Considerations

- Labor (operating and maintenance)
- Maintenance (materials and vendors)
- Treatment chemicals
- Energy (electrical, natural gas, fuel oil)
- Monitoring
- Waste disposal

Direct Capital Cost Considerations

- Equipment
- Installation
- Instrumentation and control
- Piping
- Buildings
- Site preparation
- Demolition
- Land

Indirect Capital Cost Considerations

- Engineering
- Construction expenses
- Contractor fees
- Contingency

Regulated and Non-regulated Pollutants

Regulated currently:

- Ammonia-N
- Benzene
- Benzo-*a*-pyrene
- Naphthalene
- Oil and grease
- pH
- Phenols (4AAP)
- Total cyanide
- Total suspended solids

Candidate pollutants:

- Free cyanide
- Ethylbenzene
- Nitrate
- Phenol
- Polyaromatic hydrocarbons
- Selenium
- Thiocyanate
- Total Kjeldahl nitrogen
- Total nitrogen
- Xylene